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THE STATUS OF BARK BEETLES OTHER THAN MOUNTAIN PINE BEETLE

FOREST SERVICE REGION 4

November 1963

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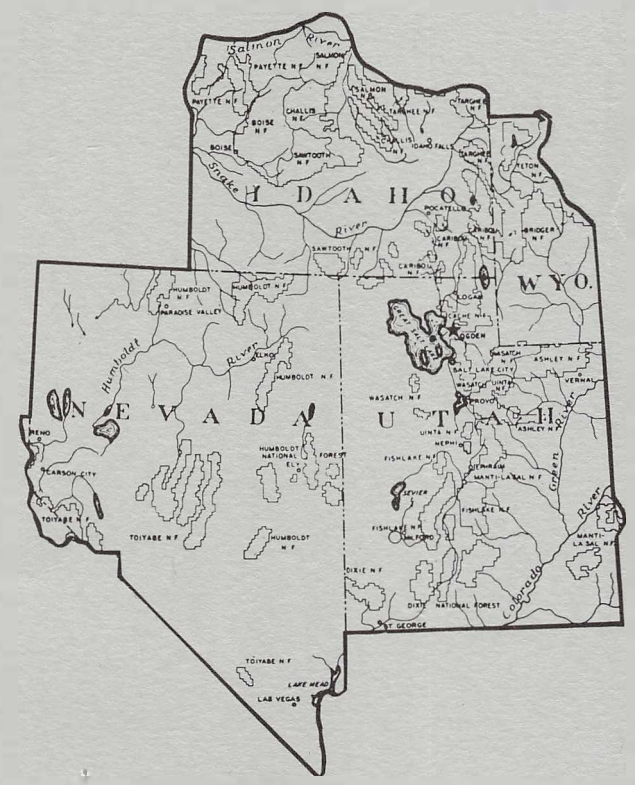

BRANCH OF FOREST INSECT AND DISEASE
PREVENTION AND CONTROL

DIVISION OF TIMBER MANAGEMENT

Forest Service
U. S. Department of Agriculture
Ogden, Utah

THE STATUS OF BARK BEETLES OTHER THAN MOUNTAIN PINE BEETLE

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INTRODUCTION

This report presents current information on infestations of bark beetles in conifer stands, other than mountain pine beetle (Dendroctonus monticola Hopk.) on lands of all ownerships in the territory covered by the U. S. Forest Service, Region Four. The Intermountain Region (4) territory encompasses all of the States of Utah, Nevada, the western half of Wyoming, and southern two-thirds of Idaho. While the beetles discussed in this report are presently less destructive than the mountain pine beetle, they have in recent years destroyed or damaged large numbers of trees.

The purpose of this report is to record the information available on the present status and possible trend of the Engelmann spruce beetle (Dendroctonus engelmanni Hopk.), Douglas-fir beetle (Dendroctonus pseudotsugae Hopk.), fir engraver beetle (Scolytus ventralis Lec.), western balsam bark beetle (Dryocoetes confusus Sw.), and (Pithyophtorus sp.), and other miscellaneous bark beetles active in localized areas.

ENGELMANN SPRUCE BEETLE 1963

Engelmann spruce beetle activity decreased considerably the past year in the Intermountain Region. Aerial survey personnel found some evidence of spruce beetle infestations on the following National Forests: Bridger, Dixie, Boise, Payette, Manti-LaSal, Targhee, Teton, and the Uinta. None of these infestations could be considered aggressive epidemics and all contain only small groups of infested trees. The most serious infestations occur on the Bridger and the Dixie National Forests.

Bridger National Forest

An infestation in the upper Green River area of the Bridger National Forest in western Wyoming was discovered in 1955 and some control action using either logging and chemical treatment, or both, has been taken each year since. Chemical treatment in 1962 covered all of the infested area. Operational surveys in the fall of 1963 in the Green River Project area showed around 4,000 newly infested spruce trees. Most of the beetles are in downed and standing timber along the fringes of the timber sale areas. Final treatment of the remaining infestation was started in late fall and will be concluded next spring to insure the reduction of the bark beetle broods to a low level. Very little current fading in surrounding Engelmann spruce stands was noticeable in 1963, and it appears that the spruce beetle population in this area has been materially reduced.

Other spruce beetle infestations that are being watched on the Bridger National Forest occur in Roaring Fork Basin and in the Porcupine Creek drainage. These infestations show no grouping tendencies; the trees being widely scattered in characteristically endemic occurrence.

Dixie National Forest

Dixie National Forest personnel used a combination of salvage logging and chemical treatment of trees and parts of trees not loggable in an attempt to control Engelmann spruce beetle populations on the Griffin Top-Griffin Springs area on the south end of the Aquarius Plateau above Widstoe, Utah in 1963. Ground evaluations disclosed the project was notably successful, for very few infested trees could be found in and around the control areas. Aerial observers however, report a general increasing trend of Engelmann spruce beetle activity on the south end of the Aquarius Plateau in areas not associated with logging. Scattered singles and groups of three or four faded Engelmann spruce trees were found. These small groups could serve as a source for a general buildup of the Engelmann spruce beetle, therefore, periodic inspections will be made to insure early discovery of any epidemic tendency.

Teton National Forest

During 1961-62, high velocity winds caused widespread, scattered blowdown in Engelmann spruce stands throughout the Teton National Forest, including the Teton Wilderness Area. In many areas, spruce windthrow occurred adjacent to small groups of faded standing trees making conditions conducive to buildup of the Engelmann spruce beetle. Evaluations were made the past summer in these areas to determine if serious outbreaks were developing. In all the areas examined, it was found that the beetle populations were at a low level or nonexistent. Very few of the downed trees were infested and bark conditions were not favorable for the production of brood. Aerial surveys late in the fall detected very little fading around the blowdown areas. It is quite unlikely that any serious outbreaks will develop in these areas as a result of the old blowdown condition. A decrease in fading caused by Engelmann spruce beetle has been observed in other small spot infestations, and it appears that beetle activity is at a low level throughout the Teton National Forest.

Targhee National Forest

Fading in Engelmann spruce trees has been noted in the upper parts of West Targhee and main Targhee Creeks on the Targhee National Forest for the past two years. Aerial survey personnel detected no new faders the past year, and it appears that Engelmann spruce beetle activity has decreased to a low level.

Payette National Forest

Engelmann spruce beetles may be on an upward trend on the Payette National Forest. Increased activity was detected south of Burnt Knob in Trout Creek, West Fork of Chamberlain Creek out of main Chamberlain Basin, upper end of Twenty-Mile Creek, and in the vicinity of Fall Creek, just below Mosquito Box Lake. While these infestations are not large, the groups range from five to twenty currently faded trees, an increase over the previous year. These small infestations will need to be examined the coming summer to determine status and potential.

Manti-LaSal National Forest

In the 1962 evaluation report, a decline in Engelmann spruce beetle activity was predicted for the Manti-LaSal National Forest. It developed that the prediction was fairly accurate because only a few current faders were detected by the aerial observers in 1963.

One group of 20 to 25 current faders was recorded in the head of Six-Mile Creek north of Mt. Baldy Guard Station northeast of Manti, Utah. Another group of 15 to 20 currently faded spruce was detected near Geyser Pass, on the Moab Ranger District. Neither of these areas have been examined on the ground, but the faded trees do not appear in a pattern that would indicate the infestations constitute a hazard to other stands. Regular surveillance should not be relaxed in case of change toward epidemic status.

Uinta National Forest

A slight increase in fading of Engelmann spruce trees has been observed in the general areas where the spruce beetle was epidemic several years ago on the Uinta National Forest. A few scattered faders were detected near Silver Meadows, and three small groups of faders were observed south of the Wolf Creek Road. In both areas, there appeared to be small increases in the number of faders over last year. Neither of these areas were examined on the ground, but evaluations will be scheduled next year to determine the status of the beetle.

Boise National Forest

Aerial survey personnel detected what appears to be Engelmann spruce beetle activity in the North Fork of Elk Horn Creek below Walker Peak on the Boise National Forest. There were an estimated 100 to 150 faded trees scattered throughout the upper mile and a half of this drainage. This apparent infestation has not been ground checked. Spring evaluations will be necessary to determine the cause of fading in these trees.

DOUGLAS-FIR BEETLE 1963

In the years immediately preceding 1963, the Douglas-fir beetle was very aggressive throughout the Region Four area. The majority of the infestation centers occurred on steep, rocky, relatively inaccessible terrain and were small and widely scattered. However, some epidemic centers were in commercial stands and others were located in or near heavily used recreation areas. In 1963, a sudden reversal of the long-time epidemic trend took place in most of the southern Utah infestations. Throughout the remainder of the Region, with one exception, a general decreasing trend in Douglas-fir beetle activity was observed.

Dixie National Forest

The most prominent and drastic reversal of the epidemic trend of Douglas-fir beetle took place on the Dixie National Forest where in past years, this beetle had been aggressively attacking and killing large volumes of Douglas-fir timber.

In all the infestations examined, beetle activity had dropped off substantially. Evaluations of the infestations in and around Red Creek Reservoir on the Panguitch Lake District and in the Sweetwater, Horse Creek, and Mud Lakes areas on the Circleville District showed that most of the beetles did not fly in the spring as they normally do. Adult beetles were plentiful beneath the bark, but all were dead. A rather abrupt change in the behavior pattern of the beetle had been noted and reported in the 1962 conditions report on Douglas-fir beetle. Beetles did not emerge and attack new trees in May and June of 1962 as is normal, and they were found to be slow in developing. By September, 26 percent were still in the larval stage, 43 percent were still pupae, and only 31 percent were callow adults. Broods appeared active and healthy. Early spring examinations, however, revealed that almost all of the beetles, with the exception of those in infestations facing Bear Valley, remained as adults in the same trees they had overwintered in the previous year. These were the adult beetles found dead during the 1963 evaluations. The reason for the adult mortality could not be determined, but it is undoubtedly related in some manner to the factors that kept the insects in the same trees for over two years.

Around the Red Creek Reservoir an abundance of Coeloides parasites were present. In the past Coeloides has rarely been found in association with the Douglas-fir beetle on the Dixie National Forest. Only a few dead adult beetles were present in the samples containing Coeloides. It appeared that brood reduction occurred primarily prior to the adult stage.

A few live beetles and evidence some of the beetles had flown was observed in the infestation northeast of Bear Valley Ranger Station. However, an extensive examination of this area revealed nearly all of the trees attacked in 1963 were "pitched out", and only three successfully attacked trees were found.

Aerial survey personnel reported a noticeable decrease in the number of Douglas-fir faders elsewhere on the Forest. Fall inspections on many additional areas confirmed that the beetle population had been reduced to a low level on the areas examined.

Manti-LaSal National Forest

Fading in Douglas-fir stands was noticed during the aerial survey on the Manti Division of the Manti-LaSal National Forest. The diagnosis from the air indicated light to heavy damage caused by the Douglas-fir beetle. The general locations of these infestations are as follows: Northeast of Coffee Pot Ridge, around Racehorse Flat, and north of Ferron Mountain. While these infestations appeared to be epidemic from the air, fading was not as intense as it was the previous year. A few scattered infestations were detected near Shay Mountain on the LaSal Division of the Manti-LaSal National Forest. None of these have been examined on the ground.

Fishlake National Forest

A reversal in trend, which conforms with the decreasing trend of Douglas-fir beetle on the Dixie National Forest appears to have taken place also over much of the Fishlake National Forest in 1963. While Douglas-fir beetle activity continues on the Fishlake, it is to a much lesser degree than in previous years. Examinations on Thousand Lake Mountain near Loa, Utah showed dead adult beetles in the bark, similar to the conditions found on the Dixie National Forest.

In the canyons immediately west of Marysvale, Utah, there was some Douglas-fir beetle activity, but the beetle did not overwinter twice in the same trees as was the case in most of southern Utah. Sample evaluations, however, showed a declining trend in bark beetle activity had started. It appears likely the trend will continue to be downward at least through next year.

Ashley, Cache, Caribou, and Uinta National Forests

Aerial surveys on the Ashley, Cache, Caribou, and Uinta National Forests indicate that Douglas-fir beetle activity has dropped off noticeably on these National Forests following the Regionwide declining trend. Areas remaining with pronounced Douglas-fir

fading occur in the northern part of the Cache in the Eight-Mile Canyon area, and in the vicinity of Fifth Water Ridge on the Uinta National Forest.

On the Caribou National Forest, the largest groups of faders occur in Georgetown and Kendall Canyons, Corrailsen, Stump, and Montpelier Creeks, and in Diamond Flat area.

The Ashley National Forest reported a small Douglas-fir beetle infestation in Squaw Canyon. These trees were scheduled to be logged. Woodpeckers were abundant and can be expected to concentrate on any infested trees that cannot be logged.

Sawtooth National Forest

There is a noticeable decline in currently fading Douglas-fir trees on the Sawtooth National Forest in almost all areas except the Sublett Division. In this area, Douglas-fir beetle attacks have been increasing since 1956. In 1961, a 29,500 MBM sale covering 13,089 acres was made on this Division in order to utilize the infested timber, reduce beetle populations, and make the stand less susceptible to future bark beetle outbreaks. Logging has been going on for more than a year, and over seven million board feet of timber have been removed, but in spite of that, ground evaluations show that the Douglas-fir beetle is continuing an aggressive attack pattern. In 1963, 3.5 million board feet of timber, of which 2.5 million board feet were infested with Douglas-fir beetle, was logged. Examinations in and around the logged areas show beetle populations somewhat reduced, but still epidemic with definite increasing tendencies. In many of the areas where logging has not taken place, it is estimated that over 50 percent of the trees above eight inches d.b.h. have been killed or are currently infested. It is likely that the epidemic tendency will continue through next year.

Boise, Challis, Payette, Salmon, and Targhee National Forests

Douglas-fir beetle infestations on the Boise, Challis, Payette, Salmon, and Targhee National Forests have generally decreased since the previous survey. Most of the remaining infestations occur in a "shotgun" type pattern with widely scattered small groups throughout the Douglas-fir stands. Many of the attack centers are on steep slopes near the ridgetops in inaccessible areas.

A marked reduction has occurred in centers classified as large in the 1962 conditions report. Other centers appear to have become stabilized, maintaining themselves at about a one to one buildup ratio. A few have increased slightly over the previous year, and some have dropped out completely.

BEETLES INFESTING TRUE FIRS

Damage in true fir stands from bark beetles has been increasing throughout the Region Four area during the past few years. Infestations vary from a few acres in size to hundreds of acres. The insects primarily responsible are the fir engraver beetle, Scolytus ventralis Lec.), western balsam bark beetle, (Dryocoetes confusus Sw.), and Pithyophtorus sp. In 1963, many National Forest, National Park, and private lands in the Region contained sizeable fir engraver infestations. It was not possible to examine all known infestations, therefore, examination of infestations was confined to the most accessible.

Humboldt National Forest

Some rather serious infestations of fir engraver beetle, (Scolytus ventralis Lec.), have developed on the Snake Division of the Humboldt National Forest during the past two years. The most damaging infestations have occurred in or near the Wheeler Scenic area near Lehman Caves National Monument west of Baker, Nevada. In Baker, Pole, and Lehman Canyons, evaluations show that in some infestations as much as 50 percent of the stands have been killed or are infested. In adjoining areas, mortality ranges from 10 to 30 percent. Heavy mortality has occurred in and around picnic and scenic areas, and these infestations show no indication of letup. Fir engraver beetle infestations were detected scattered throughout the white fir stands in North and South Forks of Big Wash, in the South Fork of Lexington Creek, and in Snake Creek about 15 miles south of Lehman Caves. In the South Fork of Big Wash there are approximately 1,000 acres of fir engraver beetle damage. This extensive infestation is epidemic with an increasing tendency. Most of the white fir stands south of Big Wash occur on ridgetops and are relatively inaccessible. Nearly all contain small epidemic infestations.

Dixie National Forest

In southern Utah on the Dixie National Forest and Bryce Canyon National Park, fir engraver infestations that have been present for several years appear to be decreasing. Aerial and ground observations recorded less fading in true firs than in previous years, and assessment of the engraver beetle population indicates the downward trend will likely continue next year.

Fishlake National Forest

A serious infestation of fir engraver beetle was detected in Reese Canyon near Fillmore, Utah, on the Fishlake National Forest last year,

and was reported in the 1962 evaluation report. It was not possible to examine this infestation this year, so a spring evaluation is planned.

Manti-LaSal National Forest

On the Manti-LaSal National Forest, the fir engraver beetle appears to be increasing slightly on both sides of Fish Creek Ridge and along Price River. In some areas, fading has increased at a ratio of about two to one over last year. Other infestations have increased only slightly, but in general, fir engraver beetle activity on this National Forest shows no sign of dropping off.

Uinta National Forest

In Little South Fork and Bennie Creeks on the Uinta National Forest, a considerable increase in fading in true firswas noticed during aerial surveys. In some areas, the increase in faders over the previous year was as high as four to one. East of Mt. Nebo, almost all the fir stands have suffered heavy mortality and some top killing, apparently from the fir engraver beetle. In American Fork Canyon an infestation which originated high on extremely steep slopes, recently has spread downward toward the canyon bottom. Alpine and white fir trees are currently being infested near campground and recreation areas. Throughout most of the true fir stands on the Uinta, fir engraver activity has increased considerably.

Timpanogos Cave National Monument

The fir engraver beetle infestation in Timpanogos Cave National Monument near Provo, Utah also has been a problem for several years. Some control work has been practiced annually to help minimize annual losses. Epidemic conditions are still present and in general, the trend is increasing.

Wasatch National Forest

An infestation adjacent to the Solitude Ski area on the Wasatch National Forest southeast of Salt Lake City killed approximately 150 trees in 1961. In 1963, 800 to 1,000 true firs were killed. Bark samples revealed high brood densities of Dryocoetes confusus Sw., secondary bark beetles, and an unusual number of insect predators, nematodes, and predacious mites. Although insect predators were numerous, it is doubtful they will reduce the bark beetle brood densities to tolerable levels at this time. From the high brood densities which were present and the increase in number of infested trees since 1961, it is predicted that the infestation will increase in size and number of infested trees next year.

Other

Other National Forest and Park Service lands in the Region are known to contain some rather sizeable fir engraver infestations. It was not possible to examine all infestations, therefore, examination of infestations was confined to the most accessible areas, as reported above.

BARK BEETLES IN PONDEROSA PINE

Humboldt National Forest

National Forest personnel reported fading in ponderosa pine in Lehman Creek near Lehman Caves National Monument on the Humboldt National Forest out of Baker, Nevada. Evaluations showed the pines to be infested with the Black Hills beetle, Dendroctonus ponderosa Hopk. Several groups of faders near the end of the Lehman Creek road were examined. Brood densities were relatively low, but sufficient to continue the epidemic at least through next year. The trees in this area occur in small groups and singles in the transition zone between desert and forest. Because of their scarcity, they have a relatively high value for recreational and scenic purposes. Presently only about 40 trees are infested, but if the epidemic continues, the beetles could infest and destroy most of the remaining ponderosa pine trees in the area.

Bureau of Land Management, State of Utah Land - Price, Utah

Personnel from the Bureau of Land Management reported a Black Hills beetle infestation adjacent to U. S. Highways 50 and 6 near Price, Utah. The beetle outbreak is on State land adjacent to areas recently developed by BLM into a recreational site. Approximately 500 ponderosa pine trees were treated in a control effort which is expected to reduce the bark beetle population to a low level.

Dixie National Forest

In Pine Valley southwest of Cedar City, Utah, about 50 to 60 ponderosa pine were infested with the southwestern pine beetle, Dendroctonus barberi Hopk. Trees were widely scattered and occurred mostly in one, two, and three trees per group. One group of about ten infested trees was found in the campground near the Pine Valley Guard Station. A few scattered infested ponderosa pine have been present in this area for about three years. No explosive buildup has occurred and the infestation is not now epidemic in nature.

At the request of the Forest Supervisor of the Dixie National Forest, ponderosa pine thinning areas were examined for possible insect buildup in the down material as a result of the thinning operations. Some Ips activity was found in the thinning areas in Main, Allen, and Stout Canyons, and Uinta Flat. No Ips attacks were found in standing trees. All attacks were confined to down material with a diameter of six inches or greater. The present populations do not constitute a serious threat. These areas will be examined periodically however, to determine if populations develop which could become epidemic.

IPS IN PINYON PINE

Large groups of pinyon pine trees were killed by Ips sp. in southern Utah in 1962. Heavy mortality was reported in Paragonah Canyon near Paragonah, Utah, east of Panguitch along the highway to Panguitch Lake, and southeast of Escalante, Utah. In 1963, the beetle populations in these areas decreased considerably. Tree mortality was noticeably less, and this trend is expected to continue.

Infestations of Ips in pinyon pine have been present in Arches National Monument in southeastern Utah for the past two years. Suppression measures consisting of cutting and burning infested pinyon pines were started in 1962 and continued during 1963. Control efforts appear to have been quite successful and beetle populations within the Monument have been reduced to a low level. However, Ips populations are present in adjoining pinyon pine stands. Since some trees are currently being damaged or weakened by road and campsite construction, these beetles may be drawn into the National Monument.

No large infestations of Ips in Pinyon pine were detected in Nevada this year.

SUMMARY AND DISCUSSION

The bark beetles covered in this report annually kill large volumes of timber in Region Four. Outbreaks of the Engelmann spruce beetle, Douglas-fir beetle, fir engraver beetle and Black Hills beetle, characteristically occur at irregular intervals and cause severe forest damage, often simultaneously in widely separated localities. Damage by the other bark beetles mentioned in this report usually occurs in widely separated areas and generally causes only local concern.

The Engelmann spruce beetle infestations in most areas of Region Four appear to be on a downward trend. Spruce beetle populations in the two most serious infestations, located on the Dixie and Bridger National Forests are under control as a result of logging and chemical suppression. Engelmann spruce stands not associated with logging or chemical treatment on the Dixie National Forest show general but light increases in numbers of infested trees. Engelmann spruce beetle infestations on the Payette and Uinta National Forests appear to have increased slightly.

Douglas-fir beetle activity has decreased on most of the National Forests in the Region. The most pronounced decrease occurred on the Dixie National Forest where a dramatic reversal in the epidemic trend took place. On the Sublett Division of the Sawtooth National Forest, Douglas-fir beetle activity continues at a highly epidemic level. A large timber sale has been made in this area, but the logging has not, as yet, completely controlled the beetles.

Mortality in true fir stands from fir engraver beetles has increased considerably in many areas within the Region. Some of the infestations are on high, relatively inaccessible ridgetops, but many are in or near important recreational areas where aesthetics and other recreational values are being affected. An example of this is found near Lehman Caves National Monument in the Wheeler Peak scenic area of the Humboldt National Forest where heavy mortality due to fir engraver beetle attacks has occurred in true firs. Trees in this areas are scarce, and an uncontrolled epidemic could wipe out the sparse stand, leaving the area poorly suited for recreational purposes. Another example is a Black Hills beetle infestation on State land near Price, Utah, which was reported by Bureau of Land Management personnel. This infestation which was promptly controlled was adjacent to a newly developed recreation site.

Bark beetle population fluctuations can be quite subtle and hard to detect or rapid and plainly noticeable. Subtle changes are often difficult to interpret and offer the evaluating entomologist a real challenge. Prompt and accurate interpretations are essential however,

if resource damage is to be held to a minimum without undue or unnecessary expenditures of control funds. It often is more necessary and important therefore, to concentrate evaluation efforts on such general but gradual increases as that which appears to be occurring in the Engelmann spruce beetle population on the Aquarius Plateau of the Dixie National Forest, than to spend time on known large epidemic situations where control recommendations are clear cut. Indications of downtrending epidemic conditions however, require careful attention, particularly if control efforts are not to be wasted.

Rapid discovery of major reductions such as occurred with the Douglas-fir beetle in southern Utah are also important so the land manager may avoid diversion of time and money from other more pressing problems.

Timely discovery of population fluctuations and assessment of those factors affecting the pest populations is accomplished by repeated careful examinations.